REMARKS

Disposition of Claims

Claims 1-3 and 6-7 remain pending in the application. No amendments to the claims have been made in this response.

Rejections under 35 U.S.C. §103(a)

In the outstanding Office Action, the Examiner has rejected the pending claims under 35 U.S.C. §103(a) as being unpatentable over Waknine et al., US Patent 5,348,475 ("Waknine") in view of E.B. Kelly, US Patent 2,514,075 ("Kelly") and Saracsan, US Patent 4,452,964 ("Saracsan"). The Examiner suggests that the material disclosed by Waknine is not substantially or significantly different than the materials used in the presently claimed method. The Examiner further suggests that the presently claimed method of light-curing the multi-layered device after applying both layers of materials would have been obvious in view of Waknine, because there are multiple light-curing steps used in the Waknine process. In response, Applicants respectfully submit that combining the disclosures in Waknine, Kelly, and Saracsan does not render the presently claimed invention, as recited in amended claims 1-3 and 6-7, prima facie obvious for the reasons discussed below.

Applicants agree with the Examiner that **Waknine** discloses methods for making dental restorations such as veneers, inlays, onlays, crowns, and bridges. As the Examiner points out, the material used to make these restorations is polymerizable and light-curable. The material can include a mixture of monomers, oligomers, light-sensitizers, and optionally fillers. However, the Waknine restorative material is not a wax-like polymerizable material as presently claimed by Applicants. As described in Paragraph 0005 of Applicants' specification, "wax-like material" refers to material which is flowable (fluid) above 40°C and becomes dimensionally stable (solidifies: i.e. is non-fluid) at least at and below 23°C within 5 minutes. In contrast to Applicants' wax-like material, the Waknine restorative material remains flowable when it is left standing at a temperature of 23°C for 5 minutes. The Waknine material does not change from fluid to solid form. That is, the nature of the Waknine material remains the same whether the temperature is 40°C or 23°C. There is no phase change in the Waknine material as the temperature changes from 40°C to 23°C.

The evaluation and testing of the Waknine restorative material is described in a "Rule 132" Declaration made by Dr. Benjamin J. Sun, a co-inventor of the invention claimed in the subject application. The Rule 132 Declaration is enclosed with this Response.

Thus, a person of ordinary skill in the art looking at Waknine would be motivated to prepare the dental restorative materials described therein. However, combining the monomers, oligomers, and additives together (as described in Waknine) does not result in a wax-like polymerizable dental material (as defined by the presently claimed invention.) As the Examiner points out, Waknine discloses that "moldable, workable materials suitable for a wide range of dental restorative uses" can be prepared. (Col. 4, lines 5-8.) However, the Waknine restorative materials should not be considered a "wax-like polymerizable dental material" as evidenced by the attached Rule 132 Declaration. One advantageous property of Applicants' wax-like material is its ability to rapidly solidify as the temperature changes. The crystalline phase of the wax-like material can melt and then rapidly recrystallize.

Secondly, the Waknine restorative material is cured and hardened in two steps: a) by exposing it to visible light radiation so that it partially-cures; and b) by placing it in a heat/vacuum chamber so that it completely cures (col. 5, lines 15-21) and this is different than Applicants' method.

In the present invention, Applicants have discovered a completely different way of making multi-layered restorations including dental crowns. For example, a first wax-like polymerizable dental material can be applied to form the enamel portion of the dental crown. Then, the dentist can apply a second wax-like polymerizable dental material to form the dentin portion. After the first and second materials have been applied, they are polymerized via light-curing to form a hardened multi-layered crown.

The wax-like polymerizable materials (forming the first and second layers) are dimensionally stable and maintain their structure while resting in an uncured state at ambient temperature. The materials remain substantially fixed in place and do not substantially expand or shrink from their position. Although the materials have not been cured at this point, they do not substantially slump or change shape. This means that the dentist can easily work with the materials and build them up or reduce them as needed to form different layers of the restoration. Multiple layers of material are added to form the restoration. Because the material is dimensionally-stable and will maintain its shape, it is not necessary to light-cure each layer before applying successive layers. There is no need to perform layer-by-layer curing. Instead, the first wax-like polymerizable material can be applied to form the first layer. Then, the second wax-like polymerizable material can be applied over the uncured, yet shape-stable, first layer. The working and shape-stable properties of Applicants' materials are simply not found in the Waknine materials. Waknine suggests using very different restorative materials, which are not dimensionally-stable at temperatures of 23°C and less, as shown in the attached "Rule 132" Declaration.

Even if a person of ordinary skill in the art turned to the disclosures in **Kelly** and **Saracsan** and combined their teachings with Waknine, it is respectfully submitted there still would be no suggestion for the presently claimed invention. Kelly discloses that acrylic resins including methacrylates and acrylates can be used for the tooth parts and these materials will polymerize and set under the applied heat and pressure (col. 5, lines 37-64). In a manner similar to the Waknine process, the first mass of Kelly plastic must be cured so that it will maintain it shape and position before the next mass of plastic is introduced into the mold cavity.

Concerning **Saracsan**, this reference discloses urethane acrylate compositions that can be used for molding articles such as automobile parts and meat boxes. It is respectfully submitted that the conventional urethane acrylate compositions, as disclosed in Saracsan, do not have wax-like properties. As reported in Comparative Example 9 (Table 4) in Völkel, US Patent 6,057,383, compositions containing blends of polycaprolactone and aliphatic urethane diacrylate resins are thermoplastic materials that display rubber-like viscosity but are not wax-like. In Saracsan, the acrylated urethane material is described as being a viscous liquid at room temperature that can be poured into glass jars (col. 4, lines 38- 40). It is not a material which is dimensionally stable in its uncured state at ambient temperature.

In view of the foregoing, it is submitted the presently claimed invention would not be obvious based on the teachings in Waknine, Kelly, and Saracsan taken alone or in combination.

Accordingly, it is respectfully requested that this rejection of claims 1-3 and 6-7 under 35 U.S.C. § 103(a) be withdrawn.

The Office Action further rejects claims 1-3 and 6-7 under 35 U.S.C. § 103(a) as being unpatentable over Waknine et al., US Patent 5,348,475 ("Waknine") in view of Deguchi, U.S. Patent 6,136,886 ("Deguchi") and Saracsan, US Patent 4,452,964 ("Saracsan"). In response, Applicants respectfully submit that combining the disclosures in Waknine, Deguchi, and Saracsan does not render the presently claimed invention, as recited in claims 1-3 and 6-7, prima facie obvious for the reasons discussed below.

The Waknine and Saracsan references are discussed above and these points will not be repeated for the sake of brevity. It is believed that claims 1-3 and 6-7 (as amended) are patentable over the teachings in Waknine and Saracsan.

Concerning the **Deguchi** reference, Applicants agree this reference generally teaches a method of making a dental prosthetic by shaping first and second polymerizable materials. In Deguchi, the method involves molding a first colored resin to produce the enamel portion of an artificial tooth followed by molding a second colored resin for producing the dentin portion. The different tooth portions are completely polymerized in a final molding step (col. 2, lines 1-23). The resins used in Deguchi are biorestorative rubber elastic materials (col. 2, lines 50-52) – there is no disclosure or suggestion of polymerizable wax-like dental materials.

In view of the foregoing, it is submitted that the presently claimed invention would not be obvious based on the teachings in Waknine, Deguchi, and Saracsan taken alone or in combination. Accordingly, it is respectfully requested that this rejection of claims 1-3 and 6-7 under 35 U.S.C. § 103(a) be withdrawn.

Conclusion

In summary, Applicants submit that claims 1-3 and 6-7 are patentable and each of the Examiner's rejections and objections has been overcome. Accordingly, Applicants respectfully request favorable consideration and allowance of claims 1-3 and 6-7.

The Commissioner is hereby authorized to charge any additional fee required in connection with the filing of this paper or credit any overpayment to Deposit Account No. 04-0780. Should there be any outstanding matter that needs to be resolved in the present application; the Examiner is invited to contact the undersigned at the telephone number provided below.

Respectfully submitted,
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Att.: Rule 132 Declaration